FACT SHEET

as required by LAC 33:IX.3111, for draft **Louisiana Pollutant Discharge Elimination System Permit No. LA0040941, AI 19216, PER20030001** to discharge to waters of the **State of Louisiana** as per LAC 33:IX.2311.

The **permitting authority** for the Louisiana Pollutant Discharge Elimination System (LPDES) is:

Louisiana Department of Environmental Quality
Office of Environmental Services
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

I. **THE APPLICANT IS:** **City of St. Martinville**
Cypress Island Coulee Wetland Wastewater Assimilation Project
Post Office Box 379
St. Martinville, Louisiana 70582

II. **PREPARED BY:** Jim Bondy, Environmental Scientist 3

DATE PREPARED: August 11, 2006

III. **PERMIT ACTION:** reissue LPDES permit LA0040941, AI 19216, PER20030001

LPDES application received: November 19, 2003
LPDES revised application received: February 27, 2004

NPDES Permit Issued: November 1, 1996
NPDES Permit Expired: October 31, 2001

EPA has retained enforcement authority

IV. **FACILITY INFORMATION:**

A. The application is for the discharge of treated sanitary wastewater from a publicly owned treatment works into a natural wetland system serving the City of St. Martinville.

B. The permit application does not indicate the receipt of industrial wastewater.

C. The facility is located 2 miles west of the City limits and 1 mile north of Highway 96 (Terrance Highway), in St. Martinville, St. Martin Parish.

D. The treatment facility consists of a facultative lagoon (63.7 AC), two Lemna polishing zones (8.5 AC each), and a flow control structure. Disinfection is by ultraviolet light.

E. The Cypress Island Coulee Wetlands are a viable ecosystem that lies two miles west of the City of St. Martinville and north of Louisiana State Highway 96. Located northeast is Bayou Tortue and south is Cypress Island Coulee. It contains approximately 416 acres. The Cypress Island Coulee Wetlands is primarily a forested wetland classified as palustrine forested, palustrine scrub-shrub, and palustrine emergent, and estuarine emergent. Most of the wetland area in the vicinity of the proposed treatment area and along Bayou Tortue and Cypress Island Coulee is a broadleaf and needle-leafed deciduous forested wetland dominated by water tupelo and bald cypress. These forests are periodically flooded depending on recent rainfall. In the slightly elevated parts of the area, there is a mixed forest with bottomland

hardwood species including pumpkin ash, water hickory, red maple, and water elm. Much of the area seems to drain naturally during periods of low water in Cypress Island Coulee, which eventually flows into Bayou Teche. Drainage is restricted by the presence of old access roads and low levees which largely enclose this old rice farming area. (*St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis, John W. Day, Ph.D, Robert R. Lane, Ph.D, Joel Lindsey, and Jason Day, March 2004).*

The primary input of freshwater is runoff from the natural levees and rainfall. The impact of upland runoff on water quality is compounded by canalization of the swamp for transportation, flood control, and oil and gas activities. As urbanization and agriculture on the natural levees has increased, the ability of wetlands to assimilate upland runoff has diminished, because most upland runoff is channelized through the wetlands to waterbodies. The result is eutrophication of basin waters, a disturbed swamp system, altered nutrient dynamics, and reduced swamp productivity. The utilization of wetlands for assimilation of effluent from the City of St. Martinville is a return to natural conditions, which existed in the past. In addition, over drained and well oxidized soils has lead to a high level of soil oxidation and subsidence of the soil surface as indicated by exposed roots. The soil surface has subsided by 1 – 2 feet. This condition could lead to a massive blow-down of the forest during a major storm passage. Subsidence in the region has been caused by a combination of impoundment of the forest, which has stopped the inflow of water and soil building materials that would normally be present during spring flooding events, and by over-drainage, which has led to rapid drainage of the area. The proposed wastewater treatment project will be beneficial to the forest by introducing much needed water and nutrients. This introduction of wastewater will counteract future subsidence by (1) creating anoxic soil conditions, thereby immediately halting the current oxidation of the soil surface, and (2) by stimulating vegetative productivity by nutrient addition, which will increase organic matter deposition and raise soil surface elevations. (*St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis, John W. Day, Ph.D, Robert R. Lane, Ph.D, Joel Lindsey, and Jason Day, March 2004).*

The use of wetlands to assimilate treated municipal wastewater is based on a belief that the free energies of the natural system are both capable of and efficient at driving the cycle of production, use, degradation, and reuse (Odum 1978, Breaux and Day 1994). The basic principal underlying wetland wastewater assimilation is that the rate of application must balance the rate of decay or immobilization. The primary mechanisms by which this balance is achieved are physical settling and filtration, chemical precipitation and adsorption, and biological metabolic processes resulting in eventual burial, storage in vegetation, and denitrification (Patrick 1990; Kadlec & Alvord 1989; Conner et al. 1989). Effluent discharge generally introduces nutrients as NO_3, NH_4, PO_4 or organic forms. The nitrogen and phosphorus supplied in the wastewater can be removed in the short-term by plant uptake, in the long-term by peat and sediment accumulation, and permanently (in the case of nitrogen) by the process of denitrification (Hemond and Benoit, 1988). Wetlands with long residence times are best suited for BOD reduction and bacteria dieback. Many pathogenic microorganisms in sewage effluent cannot survive for long periods outside of their host organisms. Protozoa present in shallow waters actively feed on bacteria. The presence of vegetation can also improve the BOD purifying capacity by trapping particulate matter and providing sites of attachment for decomposing bacteria. Root excretions from some wetland plants can kill pathogenic bacteria (Hemond and Benoit, 1988).
The Cypress Island Coulee Wetlands are excellent for assimilation of secondarily treated municipal wastewater. The hydrology of the area is controlled by rainfall, and

by natural ridges, roads and spoil banks. These features will ensure that there is maximum contact with wetlands and long residence times for water. The relatively low loading rates and long residence times will lead to high assimilation rates of nutrients. The forest productivity is low, partially due to the low nutrient concentrations. It is likely that the added nutrients will lead to increased productivity as has been observed in other sites (*St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis, John W. Day, Ph.D, Robert R. Lane, Ph.D, Joel Lindsey, and Jason Day, March 2004).*

F. **Current Outfall 001** (Discharge into Cypress Island Coulee; thence into Bayou Tortue; thence into Bayou Teche)

Discharge Location: Latitude 30° 09' 0.2" North
Longitude 91° 51' 40" West

Design Capacity: 1.5 MGD

Type of Flow Measurement, which the facility is currently using:

Totalizer, V-notched weir and chart

Planned Outfalls 001 – 006 (directly into the Cypress Island Coulee Wetlands; thence into Cypress Island Coulee; thence into Cypress Island Coulee Canal; thence into Bayou Teche)

Design Capacity: 1.5 MGD

Type of Flow Measurement, which the facility is currently using:

Totalizer, V-notched weir and chart

The discharge points for outfall 001 – 006. The swamp is hydrologically controlled by rainfall and the potential back flooding from Bayou Tortue. Much of the area seems to drain naturally during periods of low water into Bayou Tortue. Rainfall and runoff likely dominate the hydrology. The wetlands are largely enclosed by low levees as a result of earlier rice farming and other activities. Because of this, the effluent discharge can be carefully controlled so that there is maximum contact with wetland soils and vegetation.

Outfall 001 Located west of the southwest corner of the oxidation pond. Outfall 001 consists of an east-west oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 39.43739" North
Longitude 91° 52' 03.77111" West

Outfall 002 Located west of outfall 001. Outfall 002 consists of a north-south oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 42.07738" North
Longitude 91° 52' 11.87213" West

Outfall 003 Located southwest of outfall 002. Outfall 003 consists of an east-west oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 32.57869" North
Longitude 91° 52' 22.86904" West

Outfall 004 Located northwest of outfall 003. Outfall 004 consists of an east-west oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 40.14711" North
Longitude 91° 52' 36.06533" West

Outfall 005 Located west of outfall 004. Outfall 005 consists of an east-west oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 45.19017" North
Longitude 91° 52' 49.41919" West

Outfall 006 Located northeast of outfall 005. Outfall 006 consists of an east-west oriented array of 6 discharge points spaced 20 feet apart.

Discharge Location: Latitude 30° 08' 09.08249" North
Longitude 91° 52' 28.93277" West

V. RECEIVING WATERS:

CURRENT (INTERIM) DISCHARGE:
The **current discharge** is into the Cypress Island Coulee; thence into Bayou Tortue; thence into Bayou Teche in subsegment 060301 of the Vermilion-Teche River Basin. Subsegment 060301, Bayou Teche – Interstate 10 to Keystone Locks and Dam, is not listed on LDEQ's Final 2004 303(d) list as impaired. However, subsegment 060301 was previously listed as impaired for suspended solids/turbidity/siltation, nutrients, organic enrichment/low DO, pathogen indicators, carbofuran and phosphorus, for which TMDL's have been developed.

The **critical low flow** (7Q10) of Cypress Island Coulee is 0 cfs.

The **hardness value** is 113 mg/l and the **fifteenth percentile value for TSS** is 20.3 mg/l.

The designated uses and degree of support for Subsegment 060301 of the Vermilion-Teche River Basin are as indicated in the table below[1]:

Overall Degree of Support for Subsegment	Degree of Support of Each Use						
	Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
PARTIALLY SUPPORTED	FULLY SUPPORTED	FULLY SUPPORTED	NOT SUPPORTED	N/A	N/A	N/A	N/A

[1]The designated uses and degree of support for Subsegment 060301 of the Vermilion-Teche River Basin are as indicated in LAC 33:IX. 1123.C.3, Table (3) and the 2004 Water Quality Management Plan, Water Quality Inventory Integrated Report, Appendix A, respectively.

PLANNED (FINAL) DISCHARGE:

The **planned discharge** is into the Cypress Island Coulee Wetlands; thence into Cypress Island Coulee; thence into Cypress Island Coulee Canal; thence into Bayou Teche in subsegment 060806 of the Vermilion-Teche River Basin. Subsegment 060806, Cypress Island Coulee Wetland, Forested wetland located in St. Martin Parish, two miles west of St. Martinville, one half mile north of Highway 96, west of Bayou Teche and east of the Vermilion River, is not listed on LDEQ's Final 2004 303(d) list as impaired.

The designated uses and degree of support for Subsegment 060806[1] of the Vermilion-Teche River Basin are as indicated in the table below[1]:

Overall Degree of Support for Subsegment	Degree of Support of Each Use						
	Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
FULL	N/A	FULL	FULL	N/A	N/A	N/A	N/A

[1]**The designated uses and degree of support for Subsegment 060806 (Cypress Island Coulee Wetland, Forested wetland located in St. Martin Parish, two miles west of St. Martinville, one half mile north of Highway 96, west of Bayou Teche and east of the Vermilion River), of the Vermillion-Teche River Basin are as indicated in the St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis, Final, August 2004. Draft Rule prepared November 22, 2004. Rule is final as of May 20, 2005.**

VI. ENDANGERED SPECIES:

The receiving waterbody, Subsegment 060301 and Subsegment 060806 of the Vermilion-Teche River Basin, is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U.S. Fish and Wildlife Service (FWLS). This strategy was submitted with a letter dated October 21, 2005 from Fruge' (FWS) to Gautreaux (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. I t was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat.

VII. HISTORIC SITES:

The discharge is from an existing facility location, which does not include an expansion beyond the existing perimeter. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the 'Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits no consultation with the Louisiana State Historic Preservation Officer is required.

VIII. PUBLIC NOTICE:

Upon publication of the public notice in the Office of Environmental Services Public Notice Mailing List and a widely circulated local newspaper in the area of the facility, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit to

the LDEQ contact person, listed below, and may request a public hearing to clarify Issues involved in the permit decision. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

For additional information, contact:

Jim Bondy
Environmental Scientist 3
Municipal & General Water Permits Section
Water Permits Division
Office of Environmental Services
Department of Environmental Quality
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

IX. PROPOSED PERMIT CONDITIONS:

Subsegment 060301, Bayou Teche – Interstate 10 to Keystone Locks and Dam, is not listed on LDEQ's Final 2004 303(d) list as impaired. However, subsegment 060301 was previously listed as impaired for suspended solids/turbidity/siltation, nutrients, organic enrichment/low DO, pathogen indicators, carbofuran and phosphorus, for which the below TMDL's have been developed. The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon additional TMDL's and/or water quality studies. The DEQ also reserves the right to modify or revoke and reissue this permit based upon any changes to established TMDL's for this discharge, or to accommodate for pollutant trading provisions in approved TMDL watersheds as necessary to achieve compliance with water quality standards. The following TMDL's have been established for subsegment 060301:

Suspended Solids and Turbidity

The *Total Maximum Daily Load (TMDL) for TSS, Turbidity, and Siltation for the Bayou Teche Watershed* was finalized on May 3, 2001. According to the TMDL, the most significant source of TSS in this watershed is suspended solids in wet weather runoff. Point sources do not represent a significant source of TSS. Point sources discharge primarily organic TSS, which does not contribute to habitat impairment resulting from sedimentation. Because the point sources are minor contributors and dischargers of organic suspended solids from point sources are already addressed by this Department through the permitting of point sources to maintain water quality standards for DO, the waste load allocation for point source contribution were set at zero. Monitoring for total suspended solids (TSS) in wastewater is an effective indicator of the potential presence of suspended solids in a facility's effluent. Since the TMDL determined that TSS from point sources were insignificant and did not establish water quality based limits for point sources, TSS limits for point sources are determined by technology based limitations. Thus, **TSS limitations are established in the permit**. This waterbody was found to be meeting the water quality guideline for turbidity. This subsegment has been proposed for removal from the court-ordered 303(d) list by a separate action. The same components that contribute to TSS, contribute to turbidity. Therefore, having TSS limits in the permit will help protect against the potential for the introduction of turbidity into the receiving waters.

Organic Enrichment/low DO and Nutrients

The *Bayou Teche Watershed TMDL for Dissolved Oxygen including WLA's for Twenty-Two Facilities and addressing nutrients* was finalized on December 1, 1999 and revised on January 5, 2000. No DO limits were assigned to this facility in the TMDL. However, **BOD_5 limits are**

placed in all sanitary discharge permits and is an indicator for the potential discharge of oxygen consuming pollutants that would result in DO at levels below that of the ambient waterbody and for discharges of organic material at levels exceeding state water quality. In addition, the TMDL indicates that the sources for nutrients in Bayou Teche are the upstream watersheds, Bayou Cocodrie and the Atchafayala Basin. LDEQ's position, as supported by the ruling in the lawsuit regarding water criteria for nutrients (Sierra Club v. Givens, 710 So.2d 249 (La. App. 1st Cir. 1997), writ denied, 705 So.2d 1106 (La. 1998), is that when oxygen-demanding substances are controlled and limited in order to ensure that the dissolved oxygen criterion is supported, nutrients are also controlled and limited. The implementation of best management practices in the Bayou Cocodrie watershed and the Atchafalaya Basin to control and reduce runoff of soil and oxygen-demanding pollutants from non-point sources will also control and reduce the nutrient loading entering the Bayou Teche watershed. The primary nutrient source is the Atchafalaya Basin, which has the Mississippi River as its primary source. The key to reducing nutrient loading in Bayou Teche is the reduction of nutrient loading to the Mississippi River. Therefore, **no nutrient limits will be required in this permit**.

Pathogen Indicators and Fecal Coliform

The *Bayou Teche TMDL for Fecal Coliform* was finalized on January 19, 2001. According to this TMDL, the Louisiana Water Quality Regulations require permitted point source discharges of treated sanitary wastewater to maintain a fecal coliform count of 200 cfu/100 mL in their effluent and must meet the standard at end-of-pipe. According to the TMDL, there will be no change in the permit requirements based upon a Wasteload Allocation resulting from this TMDL. Therefore, the fecal coliform limitations to the current discharge (Interim Effluent Limitations) for St. Martinville's Wastewater Treatment Plant will remain as in the previously issued permit of 200/100 ml (Monthly Average) and 400/100 ml (Weekly Average).
To protect against the development of pathogenic organisms in the receiving waterbodies, **fecal coliform limits have been established in the permit**.

Carbofuran

The *Total Maximum Daily Load (TDML) For the Pesticide Carbofuran in the Mermentau River and Vermilion-Teche River Basins* was finalized on March 21, 2002. According to this TMDL, there are no known point sources that discharge Carbofuran in the Vermilion-Teche River Basin. No allocation was given to point source discharges in the Vermilion-Teche River Basin. Therefore, **no Carbofuran limits will be required in this permit**.

INTERIM EFFLUENT LIMITATIONS:

The City of St. Martinville is planning to change the discharge route from the Cypress Island Coulee to the Cypress Island Coulee Wetlands. Interim Effluent Limitations are set up to allow the facility sufficient time to construct the new outfalls into the wetlands. Once the City completes the construction of the new outfalls into the wetlands, Final Effluent Limitations shall come into effect. However, should the City vacate the change in discharge route, the permittee shall meet the Interim Effluent Limitations until the expiration date of the permit.

OUTFALL 001 (Discharge into Cypress Island Coulee; thence into Bayou Tortue; thence into Bayou Teche)

DESIGN CAPACITY is 1.5 MGD

Interim limits shall **BEGIN** on the effective date of the permit and **LASTING UNTIL** the completion date of activities for the construction of the wetland discharge outfalls.

Effluent Characteristic	Monthly Average lbs./day)	Monthly Average	Weekly Average	Basis
Biochemical Oxygen Demand (BOD_5)	125	10 mg/l	15 mg/l	Limits are set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSELP) for facilities of this treatment type and size.
Total Suspended Solids (TSS)	188	15 mg/l	23 mg/l	Limits are set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSELP) for facilities of this treatment type and size.

Other Effluent Limitations:

1) Fecal Coliform

The discharge from this facility is into a waterbody with a designated use of Primary Contact Recreation. According to LAC 33:IX.1113.C.5.b.i, the fecal coliform standards for this water body are 200/100 ml and 400/100 ml. Therefore, the limits of 200/100 ml (Monthly Average) and 400/100 ml (Weekly Average) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgment in order to ensure that the water body standards are not exceeded, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) pH

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C., the pH shall not be less than 6.0 standard units nor greater than 9.0 standards units at any time.

3) Solids and Foam

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

FINAL EFFLUENT LIMITATIONS:

The City of St. Martinville is required to meet the Final Effluent Limitation once the construction is complete changing the discharge route from the Cypress Island Coulee to the Cypress Island Coulee Wetlands.

Systems utilizing wetland assimilation as a tertiary treatment are given secondary limits. LAC 33:IX.711.D.2.b, states that existing major facilities with treatment equivalent to Secondary Treatment, such as an oxidation pond system are given 30 – 45 mg/l BOD_5 and 90 mg/l TSS (30-day average) levels of treatment.

OUTFALL 001 - 006 - (Discharge directly into the Cypress Island Coulee Wetlands; thence into Cypress Island Coulee; thence into Cypress Island Coulee Canal; thence into Bayou Teche)

DESIGN CAPACITY is 1.5 MGD

Final limits shall become **EFFECTIVE** upon the completion of the construction of the wetland discharge outfalls, and **LASTING** through the expiration date of the permit.

Effluent Characteristic	Monthly Average (lbs./day)	Monthly Average	Weekly Average	Basis
Biochemical Oxygen Demand (BOD_5)	375	30 mg/l	45 mg/l	Limits are based on secondary treatment for sanitary wastewater in accordance with LAC 33:IX.711.D.2.b.
Total Suspended Solids (TSS)	1126	90 mg/l	135 mg/l	Limits are based on secondary treatment for sanitary wastewater in accordance with LAC 33:IX.711.D.2.b.

Heavy metals and other toxins found in wastewater can have damaging effects on wetland systems. Research has found that the movement of heavy metals in the natural cycle of the wetland vegetation and sediments implies that wetlands are not final sinks for these metals. As a result, effluents with high metals concentrations such as would be introduced by industrial waste **should not** be applied to wetland systems. Due to the potential long-term, detrimental impacts from heavy metals, salts, biocides, and other toxins, wetland discharges should be limited primarily to domestic effluent.

Other Effluent Limitations:

1) **Fecal Coliform**

The discharge from this facility is into a water body, which has a designated use of Secondary Contact Recreation. According to LAC 33:IX.1113.C.5.b.ii, the fecal coliform standards for this water body are 1000/100 ml and 2000/100 ml. Therefore, the limits of 1000/100 ml (Monthly Average) and 2000/100 ml (Weekly Average) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgment in order to ensure that the water body standards are not exceeded, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) **pH**

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C., the pH shall not be less than 6.0 standard units nor greater than 9.0 standard units at any time.

3) **Solids and Foam**

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

Toxicity Characteristics (Interim Effluent Limitations)

Based on information contained in the permit application, LDEQ has determined there may be pollutants present in the effluent which may have the potential to cause toxic conditions in the receiving stream in violation of Section 101(a)(3) of the Clean Water Act. The State has established a narrative criteria which, in part, states that 'No substances shall be present in the waters of the State or the sediments underlying said waters in quantities alone or in combination will be toxic to human, plant, or animal life...'(LAC 33:IX. 1113.B.5).

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates the effects of synergism of the effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. LAC 33:IX.1121.B.3 provides for the use of biomonitoring to monitor the effluent for protection of State waters. The biomonitoring procedures stipulated as a condition of this permit are as follows:

The permittee shall submit the results of any biomonitoring testing performed in accordance with the LPDES Permit No. LA0040941, Biomonitoring Section for the organisms indicated below:

TOXICITY TESTS	FREQUENCY
Chronic static renewal 7-day survival & reproduction test using *Ceriodaphnia dubia* (Method 1002.0)	**1/quarter[1]**
Chronic static renewal 7-day survival & growth test using fathead minnow (*Pimephales promelas*) (Method 1000.0)	**1/quarter[1]**

[1] If there is no significant lethal or sub-lethal effects demonstrated to the species at or below the critical dilution during the first four quarters of testing, the permittee may certify fulfillment of the WET testing requirements in writing to the permitting authority and WET testing may be reduced to not less than once per six months for the more sensitive species (*Ceriodaphnia dubia*) and not less than once per year for the less sensitive species (*Pimephales promelas*) for the remainder of the life of the permit.

Dilution Series – The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional concentrations shall be 30%, 40%, 54%, 72%, and 96%. The low-flow effluent concentration (critical low-flow dilution) is defined as 96% effluent. Results of all dilutions shall be documented in a full report according to the test method publication mentioned in the Biomonitoring Section under Whole Effluent Toxicity. This full report shall be submitted to the Office of Environmental Compliance as contained in the Reporting paragraph, also located in the Biomonitoring Section of the of the permit.

The permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.2903. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

Wetland System Monitoring (Final Effluent Limitations)

The five (5) year LPDES permits contain technology-based effluent limitations for BOD_5, TSS, and pH reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the LPDES permits. State narrative and numerical water quality

standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

The state has established a narrative water quality criterion, which states that:

"No substances shall be present in the waters of the state or the sediments underlying said waters in quantities that alone or in combination will be toxic to human, plant, or animal life or significantly increase health risks due to exposure to the substances or consumption of contaminated fish or other aquatic life." (*Louisiana Surface Water Quality Standards*, LAC Title 33, Part IX, Chapter 11, Section 1113.B.5.)

However, the State of Louisiana has set the following specific criteria for the protection of the receiving Natural Wetlands (the Cypress Island Coulee Wetlands):

> **No more than 20% reduction in the total above-ground forested wetland productivity as measured by litter fall and stem growth data.**

BACKGROUND AND BASIS FOR CRITERIA IMPLEMENTATION AND ASSESSMENT

Forest productivity is a key measurement of overall ecosystem health in the forested wetlands of south Louisiana (Conner 1994, Day et al. 2004). Tree growth, both leaf litter and stem growth, is dependent on a number of factors, including hydrology, nutrient availability and past management practices (Conner 1994; Conner and Day 1976, 1988a and b; Ewel & Odum 1984). Hydrology will not be influenced to a significant degree in the receiving wetlands by this project, with exception of the areas immediately surrounding the discharge locations. The underlying ecological model is that the addition of secondarily-treated nutrient rich municipal wastewater to south Louisiana wetlands will promote vertical accretion through increased organic matter production and deposition, counteracting the effects of hydrological isolation and subsidence. Rybczyk et al. (2002) reported that municipal effluent application at Thibodaux, Louisiana increased soil accretion rates by a factor of three and Hesse et al. (1998) showed that cypress trees at the Breaux Bridge wastewater assimilation wetlands, which have received wastewater effluent for 50 years, had a higher growth rate than nearby trees not receiving effluent.

At each study site a 10 x 100 m quadrate was established to measure forest productivity. Productivity of a forested wetland is defined as the sum of stem growth (perennial productivity) and leaf and fruit fall (ephemeral productivity). Perennial productivity was calculated using diameter at breast height (dbh) measurements of all trees with dbh greater than 3.2cm. Measurements of dbh were taken annually during winter when trees are dormant, and biomass calculated using allometric equations based on dbh. Ephemeral productivity was measured using 0.25m^2 leaf litter boxes, with screened bottoms and approximately 10 cm wide sides. Six boxes were placed randomly in each study site. Leaves and other materials that collected in the boxes were gathered bimonthly, separated into leaves and woody material, dried to a constant weight, and weighed. Aboveground net primary productivity (NPP) was calculated as the sum of ephemeral and perennial productivity. (*St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis*, Final Report – August 2004, John W. Day, Ph.D., Robert R. Lane, Ph.D., Joel Lindsey, and Jason Day).

BASIS FOR WETLAND MONITORING

The EPA document *Biological Criteria: National Program Guidance for Surface Waters*, discusses the Clean Water Act and states that "the general authority for biological criteria comes from Section 101(a) of the Act which establishes as the objective of the Act the restoration and maintenance of

the chemical, physical, and biological integrity of the Nation's waters, including natural wetlands. To meet this objective, water quality criteria must include criteria to protect biological integrity. Section 101(a)(2) includes the interim water quality goal for the protection and propagation of fish, shellfish, and wildlife." Biological integrity is functionally defined in this EPA manual as "the condition of the aquatic community inhabiting the unimpaired waterbodies of a specified habitat as measured by community structure and function." The importance and function of wetlands include, but are not limited to the following: erosion and flood control, saltwater intrusion control, water quality enhancement, habitat for threatened and endangered species, wildlife habitat, nutrient material cycling, recreation and aesthetics.

Natural wetland loss is a problem in Louisiana. This problem is caused by insufficient sedimentation and relative sea level rise each year. The introduction of nutrient rich wastewater to natural wetlands is beneficial in that it stimulates productivity in the wetland. This productivity promotes vertical accretion through increased organic matter deposition and the formation of soil through increased root growth. This vertical accretion helps maintain the wetlands, despite the rising water levels. Additionally, the total suspended solids, provided by the wastewater, also increase the sediment level in the wetland.

Although the introduction of wastewater into natural wetlands renders benefits to the wetland system, changes to the system will occur. Therefore, it is important to address issues, which will indicate the extent of these changes and to determine if the changes are acceptable. While standard biomonitoring indicates affects on organisms found in free flowing streams and rivers, the biological monitoring schedule proposed below is broader in scope, and more specific to the wetland ecosystem, than standard biomonitoring. It will provide a more direct indication of change in functions of the wetland system as a whole. The proposed biological monitoring schedule for the City of St. Martinville/Cypress Island Coulee Wetland Wastewater Assimilation Project is based on Best Professional Judgment, taking into account the size and characteristics of the wetland system.

REMOVAL OF FAUNAL MEASUREMENTS

The analysis of the benthic and nekton communities at all studied wetland assimilation sites have shown no clear patterns with respect to the treated effluent. The organisms present at the different wetland assimilation sites are typical of healthy systems in Louisiana and are similar to those of other wetland sites in Louisiana not affected by treated effluent (Sklar 1983, Conner et. al. 1989, Day et. Al. 1994 1997 a, b, 1998, 1999, Pratt 1998), despite the fact that several of the treatment wetlands has received effluent from 10 to 50 years. In a detailed study of the benthic community of a system of mixed marsh and swamp vegetation at Amelia, Louisiana that had received wastewater for 25 years, Pratt (1999) reported very little differences in areas receiving effluent as compared to control areas. This is consistent with findings from other areas. Differences do exist in benthic communities between swamp and marsh sites. For example, multidimensional scaling of benthic community data from Mandeville exhibits a separation of marsh and swamp stations, reflecting the differences in these two communities (Day et. al. 1999). There were no significant differences, however, in the groupings of the different swamp stations with respect to treated effluent. The Bayou Castine control site and the Bayou Chinchuba reference site did not separate out from the sites influenced by the treated effluent discharge. This indicates that the effluent was not having a significant impact on the benthic community.

Benthic communities similar to those in the sediments of southern Louisiana have been used to evaluate the impacts created by organic enrichment (Hellawell 1986). Most studies have related from nutrient enrichment to secondary effects, largely oxygen reduction and increased primary productivity (Hellawell 1986). Results at Amelia, Louisiana (Pratt 1998) indicate that the benthic assemblage abundance and taxa composition had a predictable response to secondary effects of

wastewater. It is speculated that the invertebrate community structure in Louisiana wetlands result from interaction of the moderate to low nutrient concentration near effluent discharge and the effects of floating aquatic vegetation community on surface discharge (Pratt 1998), but it is difficult to attribute variations in the benthic community to wastewater impacts (Pratt 1998, Day et. Al. 1998, Sklar 1983). Taxa that are characteristic of those near highly enriched effluent discharges are not characteristic of wetland assimilation sites in Louisiana (Lenat 1983). The organic nature of deltaic swamps and marshes can also influence the community composition toward taxa that are tolerant of low oxygen levels (Pratt 1998). Major factors that most commonly influence invertebrate structure are water flow, oxygen levels in the water column, and an invertebrate community that is tolerant to organic enrichment (Pratt 1998, Day et. Al. 1998, Kadlec and Avord 1989, and Lenat 1983).

From the results from a number of wetland assimilation sites in Louisiana, we conclude that the benthic and nekton community sampling is not likely to provide relevant data for the monitoring program. Therefore, benthic monitoring will no longer be included as part of wetland assimilation permits.

PROPOSED BIOLOGICAL TESTING

The following parameters are proposed to be sampled and monitored for the specified wetland component at all three (3) wastewater management areas and all three (3) control areas:

- **Sampling and classifying the flora** present and determining percentage of total cover for each vegetative species. The sampling will provide information on whether dominance and species diversity of the community is being altered.
- **Growth studies of vegetative productivity**, which will provide an indication of health and vigor of the plant community.
- **Water stage** is a gauged measurement of the water depth, which will assist in determining stress in the wetlands from hydrologic loadings and will determine the existence of a zone of influence resulting from wastewater applications. The zone around the discharge serves to assimilate the wastewater most effectively. This zone grows larger as wastewater continues to be discharged and the assimilative capacity of the immediate area becomes saturated.
- **Metals and nutrient data from plant tissue samples**, which will identify excesses or deficiencies that could become problematic.
- **Sediment analysis for metals, and nutrients**, which will indicate whether or not metals are bound and buried in the sediments, and nutrients assimilated.
- **Corresponding analysis of surface water** must be made to provide a comparison of water quality in the vicinity of the discharge and at increasing distance from it.

  Compared to data from the baseline study and the control area, the effects of the discharge on the biological integrity (as defined above) may be accurately assessed.

BASIS FOR ESTIMATE OF WETLAND PLANT PRODUCTIVITY

To measure tree production in the Cypress Island Coulee Wetland reference site, two 16 x 16 meter plots were established at each site. Within each plot, all trees with a diameter at breast height (dbh) greater than 10 cm were marked with an aluminum identification tag and the species recorded. Tree productivity (total above ground) will be determined from measurements of litter fall and dbh measurements. Litter fall will be collected from established litter boxes, separated into leaf and woody material, dried at 60° C and weighed. Monthly litter fall will be summed for each box to obtain annual leaf litter fall. Tree biomass will be estimated using dbh vs. tree biomass allometric equations calculated for each species in similar forests in the southeastern U.S. Change in biomass from year to year represents annual wood production. These values for annual litter fall and stem

growth can be summed to give annual above ground productivity.
To calculate marsh grass above ground productivity, five clip plots of peak biomass will be collected from each established location at the end of the growing season for each year will be estimated as equivalent to the harvested live material (Peak Standing-Crop Method).

The wetland monitoring procedures stipulated as a condition of this permit are as follows:

PARAMETER	WETLAND COMPONENT		
	FLORA	SEDIMENT	SURFACE WATER
Species Classification	P		
Percentage of Whole Cover (for each species)	P		
Growth Studies	A_1		
Water Stage			M
Metals Analysis: Mg, Pb, Cd, Cr, Cu, Zn, Fe, Ni, Ag, Se	P_1	P_1	S
Nutrient Analysis I: TKN, TP	P_1	P_1	S
Nutrient Analysis II: NH_3N, NO_2N, NO_3N, PO_4		P_1	S
Others: BOD_5, TSS, pH, Dissolved Oxygen			S

Water quality will be monitored by taking water samples along the path of flow of the effluent in the treatment site and from one or more control sites.

Sampling in the **WASTEWATER MANAGEMENT AREA** must be sampled as follows:

Collection of a minimum of three samples per site in each of three sites: 1) 100 meters from the discharge point, 2) midway, and 3) at the point where water discharges into a receiving waterbody.

Sampling in the **CONTROL AREA** must be sampled as follows:

Collection of a minimum of three samples per site in each of three sites: All three samples will be taken from a site or sites similar to the wastewater management area.

A: **ANNUALLY.** Sample once per year at all three (3) WASTEWATER MANAGEMENT AREAS and all three (3) CONTROL AREAS and included in the yearly report.

A_1 – Stem growth and litter fall

M: **MONTHLY.** Samples should be taken at all three (3) WASTEWATER MANAGEMENT AREAS and all three (3) CONTROL AREAS each month and included in the yearly report.

P: **PERIODICALLY.** Sampling must be made once during March through May, and once during September through November in the fourth year of the permit period for all three (3) WASTEWATER MANAGEMENT AREAS and all three (3) CONTROL AREAS.

P_1 – Sample preservation, handling, and analysis must meet the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, or most recent revision) or an equivalent substitute as approved by the administrative authority.

S: **SEMI-ANNUALLY.** Sample twice per year: once during September through February, and once

during March through August for all three (3) WASTEWATER MANAGEMENT AREAS and all three (3) CONTROL AREAS and included in the yearly report.

Sampling procedures to be used during the wetland monitoring phase. (*The Use of Louisiana Swamp Forests for Application of Treated Municipal Wastewater: Standard Operating Procedures for Monitoring the Effects of Effluent Discharge*. John W. Day, Jr., Joel Lindsey, Jason N. Day, and Robert R. Lane, Comite Resources, Inc. Used with the permission of Dr. John W. Day, Jr., March 14, 2003)

WATER QUALITY

1. **Dissolved oxygen and water temperature:** is measured using a Yellow Springs Instrument Co. meter or an ORION Model 820 Dissolved Oxygen meter or equivalent. The probe will be calibrated within four hours of use with a known standard (100% air saturation).

2. **pH & TDS:** Measurements of pH and TDS (Total Dissolved Solids) are made in the field using a Corning Checkmate M90 Field System or equivalent. Water samples will be collected in 500 ml polyethylene bottles and returned to the laboratory where pH will again be measured in the lab using a Jenco Markson pH meter, Model 6100 or equivalent.

3. **Nutrients:** Discrete water samples will be taken 5 to 10 cm below the water surface with effort taken not to stir bottom sediments or include any film that may be present on water surface. Samples are collected in 500 ml acid washed polyethylene bottles. The samples will be immediately stored at 4^{B}C, on ice, for preservation. The samples will be transported to an analytical laboratory, and within 24 hours filtered and sub-sampled. Samples analyzed for NO_2 + NO_3, NH_4 and PO_4 will be filtered in the laboratory using 0.45 um Whatman GF/F glass fiber filters or equivalent, and unfiltered samples will be sub-sampled into 125 mL bottles. Both filtered and unfiltered samples will be frozen until analysis. The samples will be analyzed for nitrite + nitrate ($NO2+NO_3$-N), ammonium (NH_4-N), total nitrogen (TN), total phosphorus (TP), and phosphate (PO_4-P) by an EPA and DEQ approved analytical laboratory using Standard Methods.

4. **Total Suspended Solids:** TSS will be determined by filtering 100-200 mL of sample water through re-rinsed, dried and weighed 47 mm 0.45 um Whatman GF/F glass fiber filters. Filters will then be dried for 1 hr at 105^{B} C, weighted, dried for another 15 minutes, and reweighed for quality assurance (Standard Methods 1992).

5. **Biological Oxygen Demand:** BOD samples will be collected in standard 300 ml glass BOD bottles. BOD_5 analysis will be from water samples collected in 500ml polyethylene bottles, stored on ice and taken to the laboratory for analysis. Initial D.O. will be measured within 24 hours. Final D.O. will be measured after 5 days of incubation at 20^{B}C. Measurement of BOD is the responsibility of the facility.
6. **ICAP Analysis:** Water samples will be collected from the effluent pipe and surface water in the treatment and control area for ICAP and IC analysis. The following will be measured: Mg, K, S, Na, Ca, B, P, Pb, Zn, Cr, Si, Co, Fe, Mn, Ni, Al, Cd, Cu, F, Cl, Br, NO_3, NO_2, PO_4, SO_4.

7. **Coliform Analysis:** Fecal coliform (i.e. *Escherichia coli)* will be tested using membrane filtration as a field preparation, and then sent to an EPA certified laboratory for analysis. Ten ml of sample water will be passed through a 0.45 micron filter. The filter will be stored in a sterile petri dish and brought within 8 hrs to a certified laboratory for analysis.

8. **Statistical Analysis:** One-way analysis of variance analysis will be carried out to compare treatment and control area parameters using statistical software. An alpha probability level of <0.05 will be used to define a significant difference. Comparisons of means with significant ANOVA tests will be made using Tukey-Kramer Honestly Significant Difference (HSD) test (Sall and Lehman 1996). Other statistical tests may be used as appropriate.

SOILS

1. **Sediment Cores:** At least one sediment core will be taken from each study site (Treatment & Control) with a 7.5 cm stainless steel corer. Following the removal of large litter debris, the top 10 to 20 cm of the samples will be separated by horizon, dried, ground and analyzed. Parameters measured will include: pH, electrical conductivity (EC), and Mg. Pb, Cd, Cr, Cu, Zn, Fe, Ni, Ag, Se, NH_3-N, NO_2+NO_3-N, PO_4-P, TKN, and TP. All elemental analyses will be done using an inductively coupled argon plasma quantometer (ICP). Results will be reported as the average of duplicate analyses that are within a 10% confidence interval. The results will be based on oven dry weight.

VEGETATION

To sample forest vegetation, three or more 20 m x 20 m (or equivalent size) subplot should be established at each main plot. Normally, main plots will be established at a near, mid, and outlet locations in the Treatment site, and another main plot established at a Control site. The plots will be orientated perpendicular to the hydrological gradient. All trees >10 com in diameter at breast height (dbh) within each plot will be tagged with an identification number.

1. **Tree Species Composition:** The relative importance of each major tree species in both the treatment and control areas will be based on the density (total number), dominance (basal area), and frequency of occurrence in each of the plots using equations 1-4 (Barbour et al. 1987).

   Relative density = (individuals of a species)/(total individuals of all species) (1)

   Relative dominance = (total basal area of a species)/(total basal area of all species) (2)

   Relative frequency = (frequency of species)/(total frequency of all species in area) (3)

   Importance Value = Relative density + Relative dominance + Relative Frequency (4)

2. **Above Ground Biomass:** Biomass production of a forested wetland is defined as the sum of the leaf and fruit fall (ephemeral productivity) and aboveground wood production (perennial productivity, Newbould 1967).

   A. **Ephemeral or litter fall Productivity:** To estimate ephemeral productivity, litter fall should be collected using 0.25 m^2 boxes with 1 mm mesh bottoms. At least 2 leaf litter boxes should be installed in each subplot (a minimum of 6 boxes at each main plot). The boxes will be placed randomly in each plot. The baskets will be elevated to prevent inundation during high water periods. Litter fall should be collected bimonthly or monthly, depending on the season (litter fall is highest during Fall and Winter). We use the term 'leaf litter' in reference to all non-woody litter including flowers, fruits, and seeds that typically account for <10% of the non-woody litter fall total (Megonigal and Day 1988). Leaf litter will be separated from woody litter, dried to constant mass at 65^BC, and weighed. Leaf litter weights throughout any given year will be summed and extrapolated to g $m^{-2}yr^{-1}$ units.

   B. **Perennial Productivity:** Stem biomass will be estimated from annual changes in wood biomass calculated using allometric equations based on stem diameter at breast height (dbh ~ 0.3m) as the independent variable (Table 1). The diameter at breast height (dbh) of all tagged trees will be measured above and below (~5 cm) the identification tag during the winter dormant period. This method allows measurement a safes distance from the tag's nail, which often caused the trunk to swell. Diameter will be measured above the butt swell on large cypress trees. Woody production will be calculated using regression equations

(Scott et al. 1985; megonigal et al. 1997, Table 1) based on the diameter for each species as the independent variable. We assume that the contribution of wood and stems <10 cm dbh and herbs will be a relatively small fraction of above-ground net primary production (megonigal et al. 1997). The change in biomass from one winter's measurement to the next represents woody production for the year and will be extrapolated to g $m^{-2}yr^{-1}$ units.

C. **Net Primary Production:** Aboveground net primary production (NPP) will be calculated as the sum of leaf litter and wood protection, and will be given in g $m^{-2}yr^{-1}$ units.

Table 1. Regression equations used to convert diameter at breast height (DBH) measurements to overall perennial biomass. All equations are in the form: Biomass = f (DBH), where biomass is in kg, DBH is in cm and f is the parameterized function.

Species	Biomass	f(D)	DBH Range	Reference
Fraxinus spp.	Biomass (kg)	= ((2.669*((DBHcm*0.394)^1.16332))*0.454	>10 cm	Megonigal et al. '97
Taxodium distichum	Biomass (kg)	= 10^(-.97+2.34*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Nyssa aquatica	Biomass (kg)	= 10^(-919+2.291*LOG10(DBHcm))	>10 cm	Megonigal et al. '97
Acer rubrum	Biomass (kg)	= ((2.39959*((DBHcm*0.394)^2)^1.2003))*0.454	10-28 cm	Megonigal et al. '97
Quercus nigra	Biomass (kg)	= ((3.15067*((DBHcm*0.394)^2)^1.21955))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg)	= ((5.99898*((DBHcm*0.394)^2)^1.08527))*0.45	>28 cm	Megonigal et al. '97
Salix spp.	Biomass (kg)	= 10^(-1.5+2.78*LOG10(DBHcm))	n.a.	Scott et al. 1985
Other Species	Biomass (kg)	= ((2.54671*((DBHcm*0.394)^2)^1.20138))*0.45	10-28 cm	Megonigal et al. '97
	Biomass (kg)	= ((1.80526*((DBHcm*0.394)^2)^1.27313))*0.45	>28 cm	Megonigal et al. '97

3. **Understory Vegetation:** Shrubs, saplings (individuals <10cm dbh but >2.5 cm dbh), and seedlings (individuals <2.5 cm dbh) will be tabulated by species in a 5m X 5m subplot established in each 20m X 20m plot. From the data, density and basal area will be calculated for trees and density will be calculated for sapling and seedling species.

   The present cover for herbaceous vegetation will be determined by a modified line-intercept technique patterned after that proposed by DS&N, Inc. (1988). The method consists of observations made of plant species occurring along a 1m X 10m transect located at the eastern edge of each 20m X 20m plot. East 10m section is divided into 1m X 1m intervals. Species cover will be determined on the basis of the percent cover occupied within each 1m X 10m unit. Herbaceous plots will be measured at least once during the study.

4. **Nutrient and Metals Analysis of Green Leaves:** Green leaf samples should be collected during the last year of the monitoring from the major species in the treatment and control areas, once during March through May and once during September through November. Samples will be oven-dried at 70^{B}C for at least 48 hours, ground in a Wiley mill to pass a 40 mesh screen, and stored in whirl-pak bags. Samples will be analyzed in the laboratory for Mg, Pb, Cd, Cr, Cu, Zn, Fe, Ni, Ag, Se, TKN and TP. The tissue analyses should be done by a wet digestion method.

5. **Marsh Vegetation Production:** Net production in areas dominated by non-woody herbaceous vegetation will be determined by end of season live (EOSL) biomass analysis. Sampling should be conducted during the last week of September or the first week of October. At least five 0.06 m^2 clip plots will be taken at each location using randomly placed quadrants. Vegetation within the quadrant will be cut as close to the surface as possible, stored in labeled paper bags, brought back to the laboratory, and refrigerated until processing. Live material will be separated from dead, and dried at 60^{B} C to a constant weight. All data will be presented on a live dry weight per square meter basis (g dry wt m^{-2}).

X. PREVIOUS PERMITS:

NPDES Permit No. LA0040941: Issued: November 1, 1996 Expired: October 31, 2001

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Daily Average	Daily Maximum	Measurement Frequency	Sample Type
Flow	REPORT	REPORT	Continuous	Recorder
Biochemical Oxygen Demand (BOD_5)	10 mg/l	15 mg/l	2/week	6-Hr Composite
TSS	15 mg/l	23 mg/l	2/month	6-Hr Composite
Fecal Coliform	200	400	2/month	Grab
Whole Effluent Toxicity				
Daphnia pulex	REPORT	REPORT	1/year	24 Hr Composite
Pimephales promelas	REPORT	REPORT	1/year	24 Hr Composite

XI. ENFORCEMENT AND SURVEILLANCE ACTIONS:

A) Inspections

A review of the files indicates the following inspections were performed during the period beginning **January 1, 2002** and ending **December 31, 2003** for this facility.

Date – March 12, 2003
Inspector – Jack Deshotels, LDEQ/OEC/ARO
Findings and/or Violations –

1. **RECORDS** – MARGINAL – facility not recording collection and analysis time on effluent pH.
2. **EFFLUENT** – MARGINAL – review of 13 months of DMR data revealed that January 2003 results were in permit compliance. The previous 12 months from January 2002 through December 2002 revealed 28 permit excursions including both BOD_5 and TSS. These seem to occur January through June of 2002. Only 4 excursions occurred after June. The other 24 were in the first half of the year (attributed this to photo period, ambient temp.) usually when pond system has poorer performance.

B) Compliance and/or Administrative Orders

A review of the files indicates that the following Consent Decree has been filed in the United States District Court against this facility:

U.S. Department of Justice
Civil Action No.: 00-1238
United States of America – Plaintiff
Louisiana Department of Environmental Quality – Intervener - plaintiff
vs.
City of St. Martinville – Defendant/Third-party plaintiff
LEMNA Corporation – Third-party defendant

Conference Status calls are currently ongoing in the above matter.

C) DMR Review

A review of the discharge monitoring reports for the period beginning November 2002 through October 2004 has revealed the following violations:

Date	Parameter	Permit Limit	Sample Value
December 2002	BOD_5 Monthly Average	125 lbs/day	130 lbs/day
	TSS Monthly Average	188 lbs/day	214 lbs/day
January 2003	TSS Monthly Average	188 lbs/day	215 lbs/day
	TSS Monthly Average	15 mg/l	20 mg/l
	TSS Weekly Average	23 mg/l	26 mg/l
February 2003	BOD_5 Monthly Average	125 lbs/day	126 lbs/day
	TSS Monthly Average	188 lbs/day	332 lbs/day
	TSS Monthly Average	15 mg/l	28 mg/l
	TSS Weekly Average	23 mg/l	32 mg/l
March 2003	BOD_5 Monthly Average	125 lbs/day	227 lbs/day
	BOD_5 Monthly Average	10 mg/l	14 mg/l
Date	**Parameter**	**Permit Limit**	**Sample Value**
	BOD_5 Weekly Average	15 mg/l	17 mg/l
	TSS Monthly Average	188 lbs/day	423 lbs/day
	TSS Monthly Average	15 mg/l	26 mg/l
	TSS Weekly Average	23 mg/l	30 mg/l
April 2003	BOD_5 Monthly Average	125 lbs/day	150 lbs/day
	BOD_5 Monthly Average	10 mg/l	15 mg/l
	BOD_5 Weekly Average	15 mg/l	23 mg/l
	TSS Monthly Average	188 lbs/day	305 lbs/day
	TSS Monthly Average	15 mg/l	29 mg/l
	TSS Weekly Average	23 mg/l	33 mg/l
June 2003	BOD_5 Monthly Average	125 lbs/day	153 lbs/day
	BOD_5 Monthly Average	10 mg/l	11 mg/l
	TSS Monthly Average	188 lbs/day	243 lbs/day
	TSS Monthly Average	15 mg/l	17 mg/l
July 2003	BOD_5 Monthly Average	125 lbs/day	246 lbs/day
	BOD_5 Monthly Average	10 mg/l	17 mg/l
	BOD_5 Weekly Average	15 mg/l	38 mg/l
January 2004	BOD_5 Monthly Average	125 lbs/day	186 lbs/day
	BOD_5 Monthly Average	10 mg/l	16 mg/l
	BOD_5 Weekly Average	15 mg/l	18 mg/l
	TSS Monthly Average	188 lbs/day	241 lbs/day
	TSS Monthly Average	15 mg/l	20 mg/l
February 2004	BOD_5 Monthly Average	125 lbs/day	186 lbs/day
	BOD_5 Monthly Average	10 mg/l	13 mg/l
	TSS Monthly Average	188 lbs/day	380 lbs/day
	TSS Monthly Average	15 mg/l	25 mg/l
	TSS Weekly Average	23 mg/l	31 mg/l
March 2004	BOD_5 Monthly Average	125 lbs/day	152 lbs/day
	BOD_5 Monthly Average	10 mg/l	13 mg/l
	BOD_5 Weekly Average	15 mg/l	17 mg/l
	TSS Monthly Average	188 lbs/day	292 lbs/day
	TSS Monthly Average	15 mg/l	25 mg/l
	TSS Weekly Average	23 mg/l	31 mg/l
	Fecal Coliform Weekly Average	400 col/100ml	> 1000 col/100ml
April 2004	BOD_5 Monthly Average	10 mg/l	11 mg/l
	TSS Monthly Average	15 mg/l	17 mg/l

May 2004	BOD_5 Monthly Average	125 lbs/day	137 lbs/day
	TSS Monthly Average	188 lbs/day	237 lbs/day
	TSS Monthly Average	15 mg/l	17 mg/l
July 2004	BOD_5 Monthly Average	125 lbs/day	126 lbs/day

XII. ADDITIONAL INFORMATION:

The priority pollutant scan submitted by the Permittee on February 27, 2004 did not indicate any priority pollutants above the MQL. Therefore, no screen was performed for this facility.

At the present time, the City of St. Martinville discharges into Cypress Island Coulee. A Use Attainability Analysis (UAA) was conducted from February 2003 through March 2004 to determine the suitability of wetlands in the vicinity of the Cypress Island Coulee Wetlands west of St. Martinville, for assimilation of secondarily treated municipal effluent. It was found that the wetland community in the area consists of primarily forested wetlands. These forested wetlands are characterized by over drained and well oxidized soils, which have led to a high level of soil oxidation and subsidence of the soil surface indicated by exposed roots. The soil surface has subsided by 1 – 2 feet. This condition could lead to a massive blow-down of the forest during a major storm passage. Subsidence in the region has been caused by a combination of impoundment of the forest, which has stopped the inflow of water and soil building materials that would normally be present during spring flooding events, and by over-drainage, which has led to rapid drainage of the area. The proposed wastewater treatment project will be beneficial to the forest by introducing much needed water and nutrients. This introduction of wastewater will counteract future subsidence by (1) creating anoxic soil conditions, immediately halting the current oxidation of the soil surface, and (2) by stimulating vegetative productivity by nutrient addition, increasing organic matter deposition and raise soil surface elevations. This wetland wastewater assimilation project will be a benefit both economically and ecologically.

In addition, the loading rate analysis indicates that the forested wetlands will assimilate most nutrients in the secondarily treated effluent from the City's oxidation pond. It is also expected that the productivity of the swamp forest will be enhanced and oxidation of the soil will be reversed. The overall results of the study indicate that the use of the forested wetlands for wastewater assimilation will be a long-term solution for treatment of the effluent of the City's oxidation pond. (*St. Martinville Wetland Wastewater Assimilation Use Attainability Analysis, UAA for the City of St. Martinville, Louisiana*, by John W. Day, Ph.D., Robert R. Lane, Ph.D., Joel Lindsey, and Jason Day, et al. with Coastal Ecology Institute, LSU).
The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future to maintain the water quality integrity and the designated uses of the receiving water bodies based upon water quality studies. These studies may indicate the need for advanced wastewater treatment. Studies of similar dischargers and receiving water bodies have resulted in monthly average effluent limitations of 5 mg/l $CBOD_5$, and 2 mg/l NH_3-N. Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

Final effluent loadings (i.e. lbs/day) have been established based upon the permit limit concentrations and the design capacity of 1.5 MGD.

Effluent loadings are calculated using the following example:

BOD_5: 8.34 gal/lb x 1.5 MGD x 30 mg/l = 375.3 lb/day

St. Martinville plans to change their discharge route from the Cypress Island Coulee to directly into the Cypress Island Coulee Wetlands. In the event that the City of St. Martinville vacates these plans, the Interim Effluent Limitations will be continued until the expiration date of the permit. The monitoring requirements for the Interim Effluent Limitations will be as follows:

AT PRESENT for the Interim Effluent Limitations for Outfall 001 (discharge to the Cypress Island Coulee), the **Monitoring Requirements, Sample Types, and Frequency of Sampling** as shown in the permit are standard for facilities of flows between **1.00 MGD** and **5.00 MGD**.

EFFLUENT CHARACTERISTICS	Monitoring Requirements	
	Measurement Frequency	Sample Type
Flow	Continuous	Recorder
Biochemical Oxygen Demand (BOD_5	2/week	6 Hr. Composite
Total Suspended Solids (TSS)	2/week	6 Hr. Composite
Fecal Coliform Bacteria	2/week	Grab
pH	2/week	Grab

Once construction of the proposed outfalls into the wetland is completed (discharge directly into the Cypress Island Coulee Wetlands), the Monitoring Requirements, Sample Types, and Frequency of Sampling for the Final Effluent Limitations will be as follows:

UPON COMPLETION OF THE CONSTRUCTION OF Outfalls 001 – 006 (discharge directly into the Cypress Island Coulee Wetlands), **Final Effluent Limitations Monitoring Requirements, Sample Types, and Frequency of Sampling** as shown in the permit are standard for facilities of flows between **1.00 MGD** and **5.00 MGD**.

EFFLUENT CHARACTERISTICS	Monitoring Requirements	
	Measurement Frequency	Sample Type
Flow	Continuous	Recorder
Biochemical Oxygen Demand (BOD_5	2/week	6 Hr. Composite
Total Suspended Solids (TSS)	2/week	6 Hr. Composite
Fecal Coliform Bacteria	2/week	Grab
pH	2/week	Grab

CONSTRUCTION SCHEDULE

The permittee shall achieve **FINAL EFFLUENT LIMITATIONS and MONITORING REQUIREMENTS** (construction of the outfalls to Cypress Island Coulee Wetlands) as specified in accordance with the following schedule:

ACTIVITY	DATE
Begin Construction of the proposed outfalls to Cypress Island Coulee wetlands	**Within 12 months from the effective date of the permit.**
End Construction of the proposed outfalls to Cypress Island Coulee Wetlands	**No later than 12 months from the beginning of construction.**

The Permittee shall achieve Final Effluent Limitations and Monitoring Requirements upon the completion date of activities for the construction of the proposed outfalls into the wetlands.
Additionally, the permittee shall submit progress reports outlining the status of ongoing activities to change the discharge route to the wetlands on a quarterly basis until the construction is achieved.
These reports should be submitted prior to and during the construction phase in the months of January, April, July and October.

Within 14 days of completion of the outfalls, the Permittee shall notify the Department of Environmental Quality - Office of Environmental Services; Office of Environmental Compliance, Permit Compliance Unit (PCU); and USEPA Region VI in writing that construction has been completed.

Louisiana Department of Environmental Quality
Office of Environmental Services
Water Permits Division
Municipal & General Water Permits Section
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

United States Environmental Protection Agency, Region VI
1445 Ross Avenue
Dallas, Texas 75202

Where the percent project completion reported is less than would be required to assure completion of construction by the required date(s), the report of progress shall also include an explanation for this delay and proposed remedial actions.

No later than 14 days following a date for a specific action (as opposed to a report of progress) identified in the above construction schedule, the permittee shall submit a written notice to the Department of Environmental Quality – Office of Environmental Services and USEPA Region VI.

If the City of St. Martinville is unable to meet the above construction, they shall submit an alternative construction schedule, for consideration by this Office (Office of Environmental Services), within the Draft permit public notice period.

Pretreatment Requirements

Due to the absence of categorical users, it is recommended that LDEQ Option 1 Pretreatment Language be included in LPDES Permit LA0040941. This language is established for municipalities that do not have either an approved or required Pretreatment Program. This recommendation is in accordance with 40 CFR Part 403 regulations, the General Pretreatment Regulations for Existing and New Sources of Pollution contained in LAC Title 33, Part IX, Subpart T and the Best Professional Judgment (BPJ) of the review (Melissa Reboul).

Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. The permittee will accomplish this requirement by completing an Environmental Audit Form which has been attached to the permit. All other requirements of the Municipal Wastewater Pollution Prevention Program are contained in Part II of the permit.

The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	**12 Months from Audit Period Beginning Date**	**3 Months from Audit Period Ending Date**

XIII TENTATIVE DETERMINATION:

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in this Fact Sheet.

XIV REFERENCES:

Louisiana Water Quality Management Plan, Vol. 10, *Wasteload Allocations and Discharger Inventory*, Louisiana Department of Environmental Quality, 1992.

Louisiana Water Quality Management Plan, Vol. 5-B, *Water Quality Inventory*, Louisiana Department of Environmental Quality, 1998.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 11 - *Louisiana Surface Water Quality Standards*, Louisiana Department of Environmental Quality, 1999.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 23 - *The LPDES Program*, Louisiana Department of Environmental Quality, 1999.

Low-Flow Characteristics of Louisiana Streams, Water Resources Technical Report No. 22, United States Department of the Interior, Geological Survey, 1980.

Index to Surface Water Data in Louisiana, Water Resources Basic Records Report No. 17, United States Department of the Interior, Geological Survey, 1989.

LPDES Permit Application to Discharge Wastewater, City of St. Martinville, Cypress Island Coulee Wetland Assimilation Project, November 19, 2003 and February 27, 2004.

Additional information in the form of E-mails and correspondences from Comite Resources, Inc.